

JURNAL 1 THE IMPACT OF AGRICULTURAL LAND CONVERSION TO TOLL ROADS ON FARMERS “PERCEPTION AND WELFARE”

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THE IMPACT OF AGRICULTURAL LAND CONVERSION TO TOLL ROADS ON FARMERS "PERCEPTION AND WELFARE"

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ABSTRACT

The aim of study is to analyze changes in land area owned by farmers who affected by the conversion of agricultural land to toll roads, and analyze the conversion of agricultural land impact to the welfare of farmer landowners. This study uses sign test (non parametric statistics) to examine whether there are changes in livelihoods, health, educational, social and psychological conditions of farmers due to conversion land. Besides that, researcher also uses paired t_{test} to examine the change in farmers' land ownership and household income received by farmers. The result shows that before the land conversion function in Sambaswara Village is conducted, there are socialization, inventory, deliberation, and administration conducted in the village. Farmers' perceptions of socialization, inventory, deliberation, procedural and administrative service issues concerning land conversion are quite good. Means the amount of compensation received by farmer landowners is lacking. The conversion of agricultural land has a positive impact on the welfare of farmers, which includes economic, health, educational, social, and psychological aspects.

Keywords: Conversion of land, function, perception, farmer welfare

INTRODUCTION

The existence of land in human life has an important meaning and multiple functions as social and capital assets. As a social asset, land is a social units bonding in Indonesian society for life, while land capital assets is a factor of capital development (Escalante, Turvey, and Barry, 2009). As a capital asset, land has grown as a very important economic object as well as commercial material and speculation object (Cisarian and Kanes, 2012). Land must be used and utilized as much as possible for the people welfare by physic, mind, fair, and equal, while on the other hand it must be preserved (Adelaja, Hailu, Tekle, and Seeding, 2010).

As an agricultural country, agriculture in Indonesia plays vital and decisive roles for the survival and welfare of the nation and state. The role of agriculture is not only limited to health aspects by fulfilling the needs of food and nutrition for its citizens, but it is also very important to the aspects of the economy, industry, environment, social, political and security (Cisarian, Kanes, Swinnen, Van Herck, and Vranken, 2012a). In the economic aspect, agriculture is major contributor for the country's foreign exchange. Agriculture also acts as an industrial raw material supplier. In the environmental aspect, agriculture can be a preserver of natural resources and the environment. In the social aspect, agriculture can absorbs labor more than 48% of the population. According to Guyomard, Le Mouél, and Gohin (2004). In the political and security aspect, agriculture is an element of state resilience, especially food resilience (Cisarian and Swinnen, 2006, 2009; Cisarian, Kanes, and Swinnen, 2010).

25 million hectares of agricultural land were available in 1990, but it continued to shrink until 2004 remaining 14.2 million hectares which consist of 7.7 million hectares of wetlands and

6.5 hectares of dry land. Depreciation or conversion of agricultural land is very intensive in Java. In Java, more than 60% of the population lives in the area which is no more than 7% of the Indonesia land. Between 1999 and 2002, more than 149 thousand hectares of rice fields changed as residential and industrial land with the highest level of conversion occurring in West Java. According to Pewista and Harini (2013), Land shrinkage caused the swelling number of chicken mite and landless farmers.

Conversion of agricultural land for development of Surabaya - Mojokerto Toll Road as known as Suro Toll is a toll road which stretches 36.27 kilometers (Bessah, Bala, Agodzo., Oghimamhe, Boakye, and Ibrahim, 2018). Construction of this toll road began in 2007 and was completed in 2018. The construction of this toll road has resulted in land conversion in Mojokerto and Gresik. The construction of the toll road has resulted in changes in the people livelihoods, in the village due to land conversion (Cislian, and Kanes, 2012). There are also social, health, education and environmental changes (Butler, Boocaccio, Gregory, Vorisek, and Norris, 2010). Beside that, the construction of this toll road is result in reduced agricultural land in Indonesia. The aims of research are:

1. To analyze the impact of the conversion of agricultural land to the area of Farmer's Land Ownership
2. To analyze the impact of the conversion of agricultural land on welfare in the form of health, education, social and psychological for former landowners.

LITERATURE REVIEW AND HYPOTHESIS

Development Impact

Development can be both physical and non-physical. According to Halloway, Buckley, Donoghue, and Ryan (2015), Physical development is increasing prosperity and/or the welfare of the wider community, which can be done by building infrastructure, so that adequate infrastructure can drive the economy more optimally and result in opinion enhancement and in turn improving the welfare and or prosperity of the community (Iqbal and Sumaryanto, 2016)

When building an infrastructure, many countries are faced with limited amount of land, so it is necessary to do a legitimate, justified, accountable, responsible and liable government action (Iqbal and Sumaryanto, 2016), where can be applied by "takeover" land or commonly called as land conversion (Schmitz, Van Meijl, Kyle, Nelson, Fujimori, Gargel, Havlik, Heyhoe, d'Croz, Popp, and Sands, 2014).

Residents' land takeover for the development or implementation of public interests can be done in 3 (three) ways, include: the release or surrender of land rights (land conversion), revocation of land rights and direct land acquisition (buying and selling, exchanging, or other means agreed on voluntarily (Harne, Balmana, Kellermann, and Sahrbacher, 2008).

According to Jamal (2016), Land acquisition activities for development purposes are theoretically based on certain principles and divided into two subsystems: First, land acquisition by the government for public interest. Second, land acquisition by the government for other interest (commercial) (Irawan, 2016). With the existence of various land acquisition activities, the conversion of agricultural land will occur (Iqbal and Sumaryanto, 2016).

Infrastructure development, such as the Solo-Mantingan toll road, is very important to support the regional economy. The availability of infrastructure is able to provide multiplier effects for the national economy (Pewista and Harini, 2013). The infrastructure development's obstacle is land acquisition issue. Organisation for Economic Cooperation

and Development (OECD) (2008) states that Land acquisition activities are an important activity when the State desperately needs land for the construction of public facilities.

Farmer Welfare

Data from the Central Statistics Agency in Keumala and Zainuddin (2018) recorded that NTP in August 2018 was at the level of 102.56, which means declining 0.49% from the end of 2017. It is indicate that farmers' purchasing power (welfare) dropped 0.49%. While the average real wage of agricultural workers in August 2018 was Rp. 37,863 / day, increasing 0.95% from the end of 2017 (Keumala and Zainuddin, 2018). According to Happe, Balmann, Kellermann and Sahrbacher (2008), Low wages of farm laborers, lack of land owned, and selling prices of agricultural products were not profitable for farmers to make indicators of farmers' welfare haven't been able to move further. (Keumala, and Zainuddin, 2018). Although the prices of food (agriculture) often increase as before fasting and Eid, but not much impact on farmers. (Ciaian, Kancs, Swinnen, Van Herck, and Vranken, 2012b) because those who get big profits are speculators not the farmers.

Statistical hypothesis for employment change:

1. The area of farmers' land ownership before land conversion is significantly different from the area of farmers' land ownership after land conversion.
2. There is a real difference in farmers' welfare of in the form of work, health, education, social and psychological after land conversion.

RESEARCH METHOD

Determination of study areas and Respondents

The study location was determined deliberately (purposive), namely in the Samberwana village, Wringinanom District, Gresik Regency. The population is farmers whose agricultural land was affected by land conversion for the toll road construction as many as 100 respondents and determined intentionally.

Data collection

Primary data is obtained through direct interviews with farmers through a structured questionnaire. While secondary data is obtained directly from the Village Hall, District Office and related institutions. Data in this study include: land conversion in 2014, before land conversion in 2013 and after land conversion in 2015.

Analysis Method

a. Paired t-test analysis

The paired test used to determine the change in farmers' land ownership which affected by land conversion and the change in household income received by farmers after the land conversion. Using Formulas:

$$T_{\text{test}} = \frac{\bar{d}}{S_d / \sqrt{n}}$$

$$\bar{d} = \frac{\sum d}{n}, \quad S_d = \sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}}$$

Descriptions:

\bar{d} = the average difference between the area of farmers' land ownership before affected by land conversion and the area of farmers' land ownership after affected by land conversion

n = Number of farmers affected by land conversion
 S_d = Standard deviation

b. Sign test

Sign test (non parametric statistics) is used to examine farmers' perceptions of changes in farmers' livelihoods, health, education, social and psychology due to land conversion (Santoso, 2014). The form of analysis is tables that describe the condition of farmers with the types of livelihoods as follows

Table 1. Table Assistants of Sign Test for Farmers' Livelihood Types before and After Land Conversion Function

Farmer	Livelihood Types		sign
	Before conversion functions	After conversion function	
			+
			-

Descriptions:

- + : Farmers whose job is change after land conversion
- : Farmers whose type of job is remain after the land conversion.

Formula:

$$Z = \frac{2R - n}{\sqrt{n}}$$

Descriptions:

Z: z value;

R: Number of positive signs

n: Number of positive and negative signs (Santoso, 2014)

RESULTS AND DISCUSSION

1. Impact of Land Function Conversion on the area of Farmer's Land Ownership

60% or 18 farmers who were affected by land conversion gave up their agricultural land because they were 'forced' by the toll management. This is because farmers must surrender their agricultural land to be used as SUMO toll. If the farmer's do not hand over, the farmer must taking care the problem to the court. Subsequently, 13.33% or 4 people gave up their land due to urgent needs, and the rest due to various things, such as being forced because recessive land, join with other farmers, tired of farming, and urgent needs.

In the land conversion, there is compensation to replace the agricultural land of farmers which affected by the conversion of Toll road. The compensation received by farmers is used for various things, such as buying motorbikes, repairing house, umrah, and sharing with their children and siblings. Based on table 4.19, it is known that the use of the compensation is for business capital / trade of 30% or 9 people. Furthermore, 16.67% or 5 people are used to be shared with children and siblings because agricultural land is heritage so that it is distributed to children/siblings. 13.33% or 4 people used the compensation to renovate their homes so that their homes were more beautiful and comfortable to live in. Furthermore, 6.67% of former landowners use compensation to buy agricultural land again, this is because the agricultural land that they have has been released so they choose to use the compensation they receive to buy more agricultural land so that they have agricultural land such as before land conversion takes place and to fulfill their living needs (Kilian, Antón, Salhofer,

and Röder, 2012; (Lagerkvist, 2005). While 10% or 3 people uses their compensation for buy new vehicles and for their child's education. The rest, the compensation is used for unruh costs, medical treatment, buying household appliances, and others. From the table, it can be seen that besides being given to children/siblings, most compensation used for business / trade capital to obtain additional income after their agricultural land is released for toll roads.

The land conversion that occurred in Sumberwana Village certainly had an impact on the farmers' agricultural land. One of the impacts is the area of farmers' land ownership which affected by the conversion function of the Surabaya-Mojokerto Toll. The area of agricultural land that was released was an average of 782.53 m². From table 4.20, it is known that the total area of agricultural land that is freed is between 100-500 m² and > 1000 m² which is equal to 9 people or 30%, and the land area between 500-1000 m² which is equal to 8 people or 26.67%. Next, the land area that is least affected by land conversion is a land area less than 100 m², which is only 4 people or 13.33%. This has an impact on the area of agricultural land owned by farmers affected by land conversion. With the conversion of land, the area of land ownership of farmers affected by land conversion is increasingly narrow (Pewistaard Harini, 2013) and farmers who lose all their land change their work as non-farmers (Mustopa and Samosa, 2011).

Based on the data obtained, it can be seen that because of land conversion, the number of farmers who have large areas of land are decreasing and according to Pewista and Harini (2013), the number of farmers who have narrow land are increasing. Likewise, farmers who do not have agricultural land at all which before the occurrence of non-existent functions or 0% becomes available or increases up to 8 people or 26.67% after the land conversion.

The average area of agricultural land ownership of farmers affected by land conversion before the land conversion takes place is 1757.73 m², while after land conversion the average farmland area decreases to 1025.53 m² and the total area of land acquired is 782.53 m². From the SPSS result, it is known that the Paired Samples Test has t_{obs} of 6.682 with a sign value of 0.000 or <1%. This result indicates that the t_{obs} value is 6.682 > 2.462 (sign 0.000 < 0.05) means that there is a significant difference in the area of farmers' land ownership before and after the land conversion. Decreasing land ownership occurs because former landowners do not buy any agricultural land (Pewista and Harini, 2013). The compensation obtained is generally used for other things other than agricultural business such as buying a vehicle, repairing a house, sharing it with children and siblings, and so on.

2. Impact of Agricultural Land Function conversion on the former Landowners' Welfare.

a. Impact of Land Function Conversion on Farmers' Livelihoods.

After the conversion of agriculture land, the livelihoods of farmers are more various, both the main work and side jobs. Farmer job which were originally 46.67% before land conversion function decreased to 26.67% after land conversion function. According to Raggi, Sardonini, and Viaggi (2013). The decline in farmer job can be understood because there are some farmers (respondents) who used to be have agriculture land, after the land conversion do not have any agriculture land so the farmers leave their job as a farmer (Taylor and Brester, 2005).

Based on the results of sign test, it can be seen that the Exact Sig. (2-tailed) column is 0.143 (Santosa, 2014). From the SPSS result, the probability above 0.05 is obtained, so H_0 is

accepted which means there are no differences in the types of livelihoods before and after the conversion of land in Sumberwaru Village.

b. Impact of Land Function conversion on Farmer Income

Table 2. Impact of Land Function conversion on Farming and Other Farming Revenue Sources.

No.	Source of Income	Before conversion functions	After conversion function
1.	Farming	5.206.666,67	4.055.000
2.	Others farming	9.618.333,33	10.981.667
	Total	14.825.000	15.036.667

Based on the Table 2, it shows that the average income of farmers affected by land conversion after land conversion is smaller than before land conversion (Pewista and Harini, 2013). Whereas the income of former landowners from outside the farm is not-so-big increase in after and before land conversion (Raggi, Sardonini and Viaggi, 2013). Farmers' income in the table above added by harvesting (rice) that are not sold or consumed by themselves (private), this is because former landowners do not sell a portion of their crops so that the income of former landowners as listed in the table above.

Based on the t_{obs} value of -0.172 with a sign 0.865 > 0.05, which means there is no difference between the total income of former landowner farmers before and after the conversion of land because there is not much change in income from outside the farm, so that when conduct statistic test/t test found that there is no difference even though there are differences amount between before and after the conversion (Taylor and Brester, 2005).

The income of farmers in Sumberwaru Village, Wringinanom Subdistrict, Gresik Regency has two sources, namely income derived from farming and income from outside farming. The income derived from farming certainly has differences after the land conversion in Sumberwaru Village compared to the income from outside the farm (Raggi, Sardonini and Viaggi, 2013). This is because the agricultural land that they have is converted into toll roads so that the income generated from farming automatically decreases. From the SPSS result, it found that the t_{obs} value was 2.413 with a sign of 0.022 < 0.05 which means that there was a difference between the income of former landowners from farming before and after the conversion of land. (Taylor and Brester, 2005). This is because the agricultural land that the farmers have as a source of livelihood has been affected by the conversion of Toll road so that the income of former landowners from the farms declining (Pewista and Harini, 2013).

The SPSS result found that t_{obs} value was -0.996 with a sign of 0.328 > 0.05, (Santoso, 2014) which means there was no difference between the income of former landowners from outside the farm before and after the conversion of land. This is due to the fact that despite the land conversion in Sumberwaru village, it has no effect on livelihoods outside of farms of former landowners, so that the income obtained by former landowners is not how different before and after land conversion, even though there are a small number of former farmers land shifts livelihoods from farmers to non-farmers.

c. Health Aspects

From the SPSS result, it is known that by using the Sign Test, the obtained Exact Sig value. (2-tailed) is 0.727 (Santoso, 2014). This value is above the probability value of 0.05, which means that there is no change in health for former landowners between before and after land conversion. Although there are some former landowners and their families feel that their

health has declined, but most former landowners and their families feel their health is fixed before and after land conversion (Raggi, Sardonini and Viaggi, 2013). So that at the time of the sign test there were no differences / changes in the health problems of former landowners and their family farmers before and after land conversion (Pewista and Harini, 2013).

d. Educational Aspect

Land conversion also has an impact on the continuing the education of former landowner farmers in Sumberwara Village, does the existence of land conversion in Sumberwara Village affect the farther education of farmer children affected by land conversion. From the SPSS result, it is known that by using the Sign Test, the obtained Exact Sig value. (2-tailed) is 0.125. This value is above the probability value of 0.05 which means that there is no change/difference in education between former landowners and their families between before and after the conversion of land in Sumberwara Village (Pewista and Harini, 2013).

e. Impact of Land Function Conversion on Farmer Community Relations

From the SPSS result, it is known that by using the Sign Test, the Exact obtained Sig value. (2-tailed) is 0.180. This value is above the probability value of 0.05 (Santoso, 2014) which means that there is no change / difference in social relations to former landowners between before and after the conversion of land in Sumberwara Village. Although there are a small number of former landowners who have reduced community relations but most of the former landowners have community relations with the surrounding environment before and after land conversion, so that when the sign test / sign test is conducted, there is no change in community relations of former farmers landowners with the surrounding environment before and after land conversion. (Pewista and Harini, 2013).

f. Impact of Land Function Conversion on Farmer Family Relationships

From the SPSS result by using the sign test, it can be seen that the Exact Sig. (2-tailed) is 0.146. From the SPSS result, the probability is above 0.05, so H_0 is accepted which means that there is no difference in family relationship of former landowners before and after land conversion in Sumberwara Village. Although there are some former landowners who have a family relationship that has decreased but most of the former landowners have close family ties, so that at the time of the sign test is conducted, there is no difference in family relationship between before and after land conversion. Family relationship in this case is a family relationship between relatives/extended family of former landowner (Pewista and Harini, 2013).

g. Impact of Land Function Conversion on Farmers' Environment Security

From the SPSS result by using the sign test, it can be seen the Exact Sig. (2-tailed) is 0.062. From the SPSS result, the probability is above 0.05, so H_0 is accepted (Santoso, 2014) which means there is no difference in security in the environment of former landowners before and after the land conversion in Sumberwara Village. Although there are some former landowners who feel that the security in their environment is increasing, but most former landowner farmers feel that the security in their environment is fixed, so that there is no difference in environment security before and after the land conversion (Pewista and Harini, 2013).

h. Impact of Transfer of Land Function on the Farmers' Future Life Views

From the results of the SPSS test, it is known that using the Sign Test, the obtained Exact Sig. (2-tailed) is 0.774. This value is above the probability value of 0.05, which means no psychological change/difference in the former landowners' farmers before and after the land

conversion in Sumberwaru Village. Although there are some farmers affected by land conversion who feel optimistic and pessimistic, most of them feel normal before and after the land conversion so that when the sign test / sign test conducted, there is no psychological difference between farmers affected by land conversion before and after land conversion (Pewista and Harini, 2013).

i. Impact of Land Function conversion on Farmer Work Ethics

From the results of the SPSS test by using the Sign Test, it is known that, the obtained Exact Sig. (2-tailed) is 0.022. This result is below the probability value of 0.05 which means that there is a change/difference in ethos/morale on former landowners before and after the land conversion in Sumberwaru Village. The change in the morale of former landowners' farmers is due to the conversion of Toll road land making the area of farmland ownership of farmers becoming less and less so that farmers affected by land conversion are more enthusiastic to work to fulfill their needs (Pewista and Harini, 2013).

j. Impact of Land Function Conversion on Self-Esteem/ Prestige of Farmers

From the results of the SPSS test by using the Sign Test, it is known that the obtained Exact Sig. (2-tailed) is 0.001. This result is below the probability value of 0.05 which means that there are differences in self-esteem/prestige among former landowners before and after the land conversion in Sumberwaru Village. This happens because in Sumberwaru Village, former landowners receive compensation that can be used for various things that can increase their self-esteem / prestige (Pewista and Harini, 2013).

CONCLUSION

1. Land function conversion in Sumberwaru Village has an impact on the area of farmers' agricultural land that is increasingly narrow compared to before being exposed to liberation for the construction of Surabaya-Mojokerto Toll Road.
2. The conversion of agricultural land in Sumberwaru Village, Wringinanom District, Gresik Regency 'has a positive impact on former landowners and farmers' welfare which include economic, health, educational, social, and psychological aspects.

THEORY AND MANAGERIAL IMPLICATION

For those who will carry out the conversion of agricultural land, socialization and deliberation on compensation issue is very important because former landowners will not only lose their agricultural land but also lose their livelihoods:

- a. For those who will carry out the conversion of agricultural land, socialization and deliberation on compensation issues is very important because former landowners will not only lose their agricultural land but also lose their livelihoods.
- b. Give technical guidance for farmers whose agricultural land is affected by land conversion with the suggestion to buy agricultural land again so that livelihoods as farmers can still be done.
- c. In the economic aspect, the land conversion has a significant impact on the area of agricultural land ownership and the income earned from farming.
- d. The land conversion that occurred in Sumberwaru Village did not have a significant impact on the health, education, social and psychological aspects of the former landowners' farmers. (Pewista and Harini, 2013).(Jamil, 2016)

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